

White-tailed Deer Population Status 2004

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Abstract

The statewide posthunt white-tailed deer population estimate for 2004 was 1,043,000. This was 51% above the statewide goal of 692,100. With a harvest of over 166,000 adult bucks and more than 347,000 antlerless deer, the posthunt 2004 population was 6% lower than a year ago. The 2004 posthunt population was more than 20% above goal in 85 deer management units. The statewide 2004 posthunt population was the fifth highest on record.

Methods

Population estimates for most deer management units in the state were calculated using the Sex-Age-Kill (SAK) formula. This formula combines information on the age composition of the buck harvest with an estimate of the percentage of adult buck mortality that is due to legal hunting (buck recovery rate) to estimate the percentage of the adult buck population that is harvested (buck harvest rate). The size of the prehunt adult buck population in each management unit is estimated by dividing the unit's registered buck harvest by the estimate of the buck harvest rate. The prehunt adult buck population estimate is then expanded to estimate the entire prehunt deer population by 1) multiplying the buck population estimate by the adult sex-ratio to estimate the size of the adult doe population, and 2) multiplying the doe population estimate by the fall fawn:doe ratio to estimate the fall fawn population. The posthunt deer population is estimated by subtracting the total harvest from the prehunt estimate.

Primary inputs to the SAK formula are 1) year- and unit-specific harvests of antlered and antlerless deer, 2) the average percentage of yearlings among harvested bucks, 3) the average percentage of yearlings among harvested does, 4) the buck recovery rate, and 5) fall fawn:doe ratios. The percentage of yearlings among harvested bucks is used as an estimate of the annual mortality rate of adult bucks. Multi-year averages are used for yearling buck and doe percents because annual variation in reproduction or fawn survival can affect annual estimates of the percentage of yearlings, thereby biasing estimates of adult buck mortality. In addition, year- and unit-specific samples of aged deer are often inadequate for reliable estimation of yearling percents.

Average yearling buck and doe percents and buck recovery rates were updated in 2004 for most deer management units in the state. Fawn:doe ratios were updated in the Northern and Central forest regions based on the results of the Summer Deer Observation survey.

The opening weekend of the November 2004 firearm season had damp and misty weather throughout much of the state. During the next five days, temperatures were colder, skies were clear, and there was no precipitation, resulting in improved hunting conditions; however, there was no snow for tracking deer. During the closing weekend of the season, northern Wisconsin received notable snow accumulation that also stuck on trees and underbrush reducing visibility and hunter effort. Late spring planting resulted in about 5 times as much standing corn on opening weekend as normal. Because of the damp weather on opening weekend, lack of snow cover until the final weekend of the season, and greater than average amount of standing corn, the Deer Committee rated hunting conditions as average or below average. The Deer

Committee did not believe it was appropriate to adjust estimates of buck recovery rate because of the weather. Sales of gun deer licenses in 2004 were similar to 2003, 5% higher than in 2002 but were 6% lower than in 2001.

Twenty-six deer management units had earn-a-buck regulations in effect during the 2004 deer season (Table 1). Hunters were required to harvest an antlerless deer before they were allowed to harvest a buck. Therefore, buck harvest rates were greatly reduced and the SAK formula was not used to estimate population size in these units. Population size was estimated using an accounting-style population models. Model inputs were calibrated to produce the best fit between simulated trends and historic SAK estimates.

Population estimates for units in the CWD management zones also were not based on the SAK method because buck harvest rates were likely below average due to earn-a-buck regulations, as well as, possible public concerns related to hunting in areas potentially affected by CWD. Population estimates were based on helicopter quadrat surveys in the Southwest and Southeast Disease Eradication Zones (DEZs) and fixed-wing transect surveys in units in the Herd Reduction Zone. Deer per mile indices from the fixed-wing transect surveys were converted to estimates of density based on a regression model developed in the SW DEZ that related fixed-wing counts to helicopter survey estimates. In addition, accounting population models were used for 13 of 17 Herd Reduction Zone units where a series of previous SAK estimates was available to calibrate the accounting models.

Results

Estimates of size of posthunt deer populations during 2004 were made for 121 deer management units (Table 1). Statewide, the 2004 posthunt population estimate was 1,043,000, which was 51% above the posthunt population goal. The estimated statewide population was 6% lower than in 2003. The statewide 2004 posthunt population was fifth highest on record. Unit-specific posthunt population densities ranged from 9-67 deer/mi² of deer range and averaged 31 deer/mi².

In 2004, 5 units had population estimates that were more than 20% below goal. Nine units had populations that were 1-20% below goal. Twenty-two units had populations that were between goal and 20% above goal. Population estimates in 28 units were 21-50% above goal and 57 units had populations that are more than 50% above goal. Population estimates declined 20% or more from 2003 in 30 units and increased 20% or more in 19 units.

Deer populations in the Northern Forest, Eastern Farmland, and Western Farmland regions increased substantially during the 1980's (Figure 1). Aggressive harvests during the late 1980's and early 1990's, combined with very poor recruitment in the Northern and Central Forest regions in 1992, reduced populations to near goal in the North and below goal in the Central Forest. Deer populations in all regions grew rapidly following the conservative harvests in 1993 reaching an all time record posthunt population in excess of 1,120,000 in 1995. Liberal harvests in the farmland regions together with over-winter losses associated with the severe winters of 1995-96 and 1996-97 reduced populations from the 1995 peak in all regions. The near-record mild winter of 1997-98 and relatively conservative antlerless harvests in 1998 allowed population growth in all regions. Substantial antlerless harvests across much of the state in 2000, together with the moderately severe winter of 2000-01 in the Northern Forest, set the stage for population declines in all regions in 2001. Moderate population declines apparently continued in the Northern Forest and Western Farmland regions in 2002 but reduced

harvests in 2002 lessened population declines in the Eastern and Southern farmland regions. The lower harvests in 2002 led to population increased in all regions in 2003. Aggressive antlerless harvests and below average recruitment in 2004 contributed to population declines in most regions.

The posthunt population in the Northern Forest region decreased 11% from 2003 to 2004 and was 18% above goal in 2004. The Central Forest population decreased 13% between 2003 and 2004 and was 7% above goal in 2004. The Eastern Farmland population decreased 5% and was 65% above goal. Populations in the Western Farmland decreased 5% and populations in the Southern Farmland increased 2%. The Western and Southern Farmland populations were 56% and 137% over goal, respectively. The population goal in the Southern Farmland Region was 8% lower in 2004 than in 2003 because of expansion of the CWD management zones.

Table 1. *White-tailed deer population status in Wisconsin deer management units, 2003-2004.*

Region & Unit	Population goal		2003 posthunt population			2004 posthunt population			% change from 2003
	Num.	Den. ^a	Num.	Den. ^a	% over goal	Num.	Den. ^a	% over goal	
Northern Forest									
01	3,220	20	6,300	39	94	3,500	22	9	-44
01M	320	10	830	26	160	430	14	35	-48
02	9,198	18	16,600	32	81	15,600	31	70	-6
03 ^b	6,660	12	15,900	29	139	14,200	26	113	-11
04	3,490	10	5,800	17	66	5,000	14	43	-14
05 ^b	4,520	20	7,400	33	65	5,400	24	19	-28
06 ^b	5,232	12	11,000	25	111	8,500	19	62	-23
07	2,835	15	2,300	12	-19	2,300	12	-18	1
08	7,400	20	11,000	30	48	6,100	17	-17	-44
09	8,760	20	14,000	32	60	12,300	28	41	-12
10	8,625	25	9,900	29	15	8,100	24	-6	-18
11	6,820	20	8,200	24	20	7,600	22	12	-7
12	4,488	17	6,600	25	48	5,200	20	17	-21
13 ^b	10,725	15	16,600	23	55	14,500	20	35	-13
14 ^b	4,592	14	8,800	27	91	8,200	25	78	-7
17	3,570	15	6,100	25	70	4,800	20	35	-20
18	7,360	20	11,100	30	50	9,400	26	28	-15
19 ^b	8,060	20	11,000	27	37	9,600	24	20	-12
20 ^b	6,804	18	9,700	26	43	9,100	24	34	-6
24	5,560	20	7,000	25	26	9,000	32	61	29
25	8,740	20	15,900	36	82	12,100	28	38	-24
26	7,820	20	7,600	19	-3	10,300	26	32	36
28	7,216	11	14,700	22	103	11,900	18	66	-19
29A	2,868	12	4,700	20	64	4,600	19	62	-1
29B	2,796	12	3,600	16	30	2,100	9	-24	-41
30	4,725	15	7,400	23	56	6,000	19	27	-19
31	8,280	20	8,200	20	-1	8,300	20	0	1
32	10,227	21	10,900	22	7	9,300	19	-9	-15
34	4,454	17	5,300	20	19	4,700	18	6	-11
35	8,180	20	9,000	22	10	10,400	25	27	15
36	6,850	25	7,200	26	5	8,900	32	29	24
37	5,875	25	6,300	27	8	5,100	22	-13	-20
38	7,760	20	10,100	26	30	8,100	21	5	-19
39	8,220	20	6,300	15	-23	5,500	13	-33	-12
40	6,560	20	6,100	19	-7	4,800	15	-27	-21
41	4,875	25	3,900	20	-20	4,800	25	-2	24
42	6,540	20	8,200	25	26	6,500	20	0	-20
43	6,120	15	8,200	20	34	6,200	15	1	-24
44	7,922	17	8,300	18	4	7,000	15	-12	-15
45	11,860	20	10,300	17	-13	9,300	16	-21	-9
49A	5,875	25	4,800	21	-18	7,500	32	27	54
49B	4,550	25	3,400	19	-25	5,700	32	26	69
50	6,680	20	7,800	23	17	4,600	14	-31	-41
52	6,080	20	6,400	21	5	7,300	24	20	14
78 ^b	330	15	700	31	53	870	40	165	29
Regional									
total	279,642		371,400		33	330,700		18	-11

Table 1. Cont.

Region & Unit	Population goal		2003 posthunt population			2004 posthunt population			% change from 2003
	Num.	Den.	Num.	Den.	% over goal	Num.	Den.	% over goal	
Central Forest									
53	11,525	25	15,000	32	30	10,900	24	-6	-27
54A	12,100	25	15,900	33	32	13,300	27	10	-17
55	15,775	25	18,000	29	14	17,300	27	10	-4
56	10,050	30	12,000	36	20	10,100	30	1	-16
58	12,650	25	15,400	30	22	15,000	30	19	-2
Regional									
total	62,100		76,300		23	66,600		7	-13
Eastern Farmland									
27	4,960	20	9,300	38	88	7,200	29	46	-22
33	5,520	20	7,800	28	42	6,200	22	11	-21
46	8,025	25	10,700	33	33	13,700	43	71	29
47 ^b	6,725	25	9,900	37	47	9,900	37	48	1
51A ^b	5,500	25	9,200	42	67	10,000	45	81	9
51B ^b	9,725	25	16,200	42	67	16,300	42	67	0
57	3,212	22	5,300	36	66	4,700	32	48	-11
57A	5,950	25	6,900	29	16	7,300	31	22	5
57B	6,300	25	9,100	36	44	8,200	32	30	-10
57C	7,980	30	11,000	41	38	9,300	35	17	-15
62A	10,050	25	18,000	45	79	16,600	41	65	-8
62B ^b	9,075	25	20,300	56	123	15,700	43	73	-22
63A ^b	8,475	25	19,000	56	124	16,500	49	94	-13
63B ^b	6,300	25	12,400	49	97	9,700	38	54	-22
64	4,860	20	8,300	34	71	9,800	40	101	18
64M	810	10	3,300	41	310	4,500	56	461	37
65A	5,160	30	6,200	36	21	8,700	51	69	40
65B ^b	10,410	30	15,600	45	50	14,900	43	43	-5
66 ^b	4,300	25	10,700	62	148	10,700	62	148	0
80A ^b	2,280	15	5,000	33	118	5,000	33	120	1
80B ^b	3,880	20	9,400	49	143	7,700	40	98	-19
81 ^b	270	15	1,000	54	263	900	51	243	-5
Regional									
total	129,767		224,600		73	213,500		65	-5

Table 1. Cont.

Region & Unit	Population goal		2003 posthunt population			2004 posthunt population			% change
	Num.	Den.	Num.	Den.	% over goal	Num.	Den.	% over goal	from 2003
Western Farmland									
15	10,350	25	13,200	32	27	10,200	25	-1	-22
16	8,375	25	9,800	29	18	11,400	34	37	16
21	5,625	25	7,300	32	29	6,000	27	7	-17
22	6,980	20	10,700	31	54	8,100	23	16	-24
22A	7,060	20	10,600	30	51	9,900	28	40	-7
23	8,060	20	13,100	33	63	13,500	33	67	2
59A	10,400	20	14,500	28	39	10,900	21	4	-25
59B	10,305	15	17,400	25	69	17,000	25	65	-2
59C	15,650	25	23,900	38	53	32,400	52	107	36
59D ^b	7,680	20	15,500	40	102	12,000	31	56	-23
59M	440	10	800	18	75	1,800	41	307	132
60A	3,400	20	3,700	22	8	4,600	27	35	25
60B	1,660	20	2,800	33	66	2,000	24	20	-28
60M	800	10	1,900	23	131	1,700	21	113	-8
61 ^b	14,370	15	36,700	38	156	31,700	33	120	-14
Regional									
total	111,155		181,900		64	173,200		56	-5
Southern Farmland									
54B	4,650	25	6,200	33	34	9,200	49	97	48
54BCWD	2,090	10	4,800	23	130	4,800	23	130	0
54C ^b	2,375	25	4,100	44	74	3,400	35	41	-19
67A ^b	8,850	25	23,600	67	122	22,600	64	155	-4
67B ^b	4,700	25	13,800	73	144	12,100	65	158	-12
68A ^b	3,900	30	8,500	66	119	7,000	54	80	-18
68B	5,490	30	7,000	38	27	8,200	45	50	18
69	9,775	25	11,500	29	17	12,200	31	25	7
70CWD ^c	2,060	10	9,500	46	361	7,200	35	250	-24
SW-DEZ ^d	<3,920	<5	25,200	35	543	21,700	28	454	-21
70BCWD	1,940	10	6,800	35	251	4,900	25	150	-29
70ECWD	690	10	3,200	46	364	3,000	44	341	-5
70G ^e			3,600	52	73				
70GCWD ^c	1,220	10	1,800	15	48	5,700	47	370	6
71CWD	5,620	10	13,500	24	140	14,100	25	150	4
72 ^b	10,080	20	20,600	41	104	16,000	32	58	-23
73B	3,700	20	5,200	28	40	5,200	28	41	1
73BCWD	540	10	1,200	22	122	1,600	30	200	35
73D	3,160	20	4,200	27	34	3,900	25	23	-8
73ECWD	1,530	10	3,100	20	103	3,400	22	120	9
74A	3,000	15	5,400	27	81	7,600	38	155	40
74B	8,640	20	10,900	25	26	10,200	24	18	-6
75ACWD ^c	1,800	10	7,000	39	289	7,200	40	300	3
75CCWD ^c	240	10	2,500	104	942	1,000	43	329	-59
75DCWD	1,120	10	5,400	48	382	5,200	46	360	-5
76CWD ^c	1,300	10	5,400	42	315	5,300	41	310	-1
76A ^f	4,825	25	12,900	42	70	10,300	53	114	26
76ACWD	1120	10				6,400	57	470	

Table 1. Cont.

Region & Unit	Population goal		2003 posthunt population			2004 posthunt population			% change from 2003
	Num.	Den.	Num.	Den.	% over goal	Num.	Den.	% over goal	
Southern Farmland Cont.									
76MCWD ^c	510	10	2,300	45	351	1,500	29	190	-36
77ACWD	1,020	10	5,300	52	420	5,500	54	440	4
SE-DEZ ^g	<265	<5				2,700	50	902	
77BCWD	2,270	15	4,300	20	32	5,700	25	150	27
77C ^f	2,025	15	8,900	28	84	5,500	41	174	49
77CCWD	1,870	10				12,500	67	570	
77M	3,120	10	7,200	23	130	6,200	20	100	-13
Regional total	109,415		254,900		129	259,000		137	2
Total	692,079		1,109,100		60	1,043,000		51	-6

^a Deer/mi² of deer range.

^b Unit had earn-a-buck regulations in 2004. Population estimate based on accounting model.

^c Population goal and 2004 estimate apply to that portion of unit in the 2004 CWD Herd Reduction Zone. Population estimate in 2003 may apply to a different area due to changes in Herd Reduction Zone boundary.

^d SW Disease Eradication Zone includes all of 70A and parts of 8 surrounding deer management units. Population estimate in 2003 applies to a different area due to changes in Disease Eradication Zone boundary.

^e Combined in 2004 with the portion of the unit in the CWD Herd Reduction Zone.

^f Zone was split to include a portion within the CWD Herd Reduction Zone.

^g SE Disease Eradication Zone includes parts of 77A and 77B.

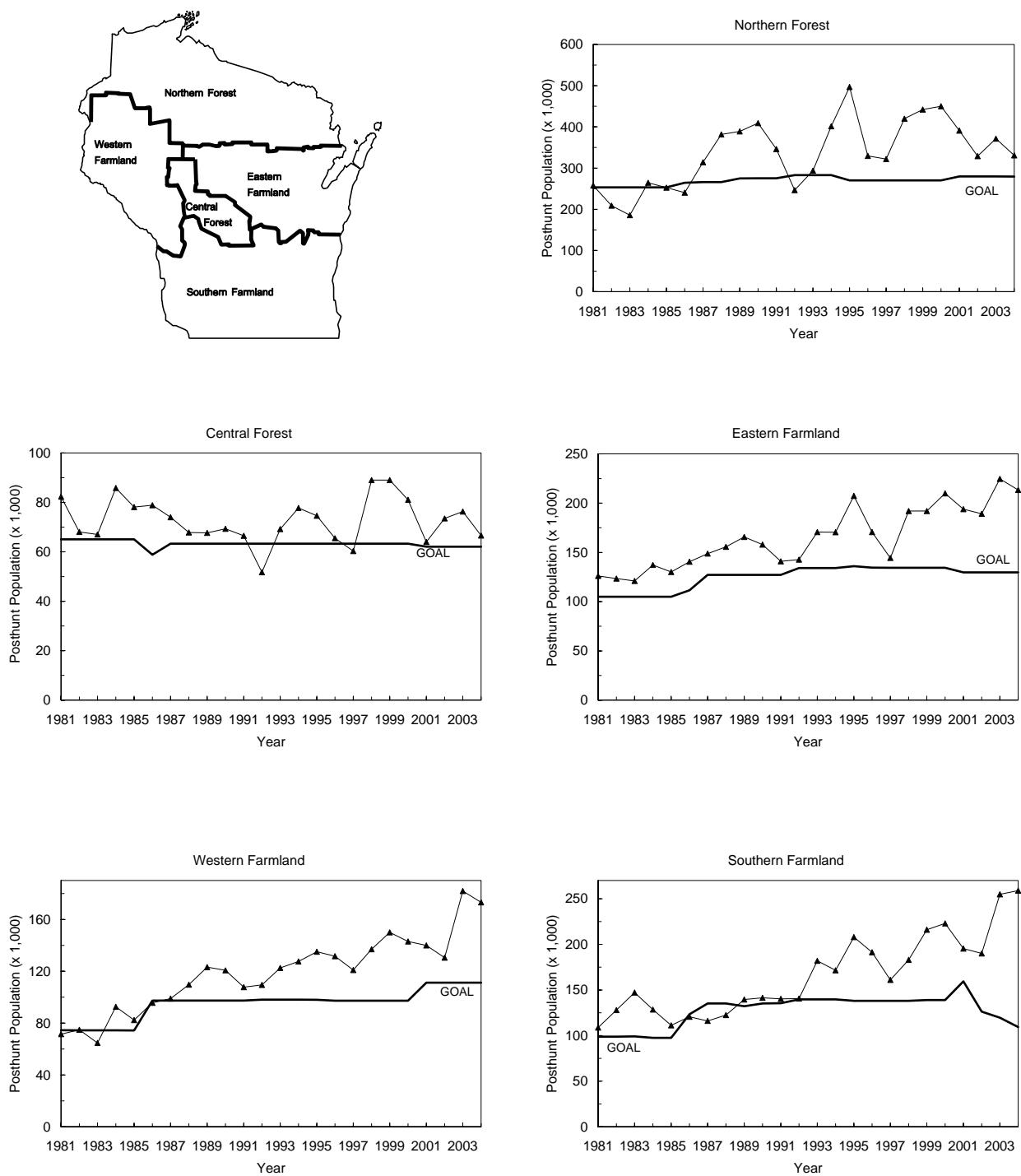


Figure 1. Regional white-tailed deer population trends in Wisconsin, 1981-2004.